

# *ProTraXX*

**Sixteen Independent Mono MP3 Players**

*User's Guide*



**Alcorn  
McBride  
Inc.**

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Artwork	Gerry Calixto, Jr.
Hardware Design	Jim Carstensen
Mechanical Design	Martin Chaney
Software Design	Hunter Olson
Firmware Design	Adam Rosenberg
Driver Development	Phil Wilshire

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**Alcorn**

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**McBride**

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**Inc.**

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**Alcorn McBride Inc.**  
**3300 S. Hiawasse Rd.**  
**Bldg. 105**  
**Orlando, FL 32835**  
**Tel: (407) 296-5800**  
**FAX: (407) 296-5801**  
**<http://www.alcorn.com>**  
**[support@alcorn.com](mailto:support@alcorn.com)**



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# Welcome!

Thank you for purchasing The Alcorn McBride ProTraXX™. The ProTraXX replaces CD and solid state audio players in permanent audio playback installations, providing hours of high-quality, maintenance-free digital audio.

The ProTraXX lets you play sixteen independent mono tracks from a single, economical rack-mount unit. It's perfect for museums, interactive displays, and background music or effects. Each track can be individually triggered by a number of methods. Discrete inputs – contact closure or voltage – allow direct connection to proximity sensors or switches. The ProTraXX can also be controlled using Ethernet, RS-232 serial, or USB. It can even be programmed to play on a scheduled-basis using its built-in Real Time Clock or execute a pre-programmed sequence of playback operations using a playlist.

ProTraXX offers the latest in Digital Audio Repeater technology, combining MP3 audio with Compact Flash for a rugged, reliable, maintenance-free solution to your playback needs. Access time is nearly instantaneous! All sixteen tracks are completely independent, and offer superb audio quality.

# Features

The ProTraXX offers a wide range of features including:

- 16 Independent Mono Audio Channels\*\*
- Hours of High-quality MP3 Audio
- Compact Flash Media Included
- Individually Configurable Voltage or Contact Closure Control
- Ethernet or RS-232 Control
- Ethernet File Transfer
- Scheduled Playback using built-in clock
- Playlists for automated operation
- “Boot-and-Loop” playback capability
- GPS Time Sync
- Microphone and Stereo Line Input

# Technical Support

You can obtain technical support or other information about specifying, installing, configuring, updating and programming your Alcorn McBride ProTraXX from several sources:

For...	Contact...	When?
Firmware Updates	<a href="http://www.alcorn.com/support">http://www.alcorn.com/support</a>	Any Time
Knowledge Base	<a href="http://www.alcorn.com/kb">http://www.alcorn.com/kb</a>	Any Time
E-mail Support	<a href="mailto:support@alcorn.com">support@alcorn.com</a>	Any Time
Telephone Support	(407) 296-5800	M-F 9am-5pm (EST)

# Getting Started

Throughout this manual you will find detailed discussions on all the features of this product. However, you're probably anxious to see your ProTraXX play some audio before you dive in to all of that. Below are a few easy steps to show you how to play audio from the ProTraXX right out of the box!

**\*\* IMPORTANT NOTE: THE PROTRAXX IS NOT DESIGNED FOR AND SHOULD NEVER BE USED TO PLAY SAFETY-RELATED ANNOUNCEMENTS.**

## In the Box

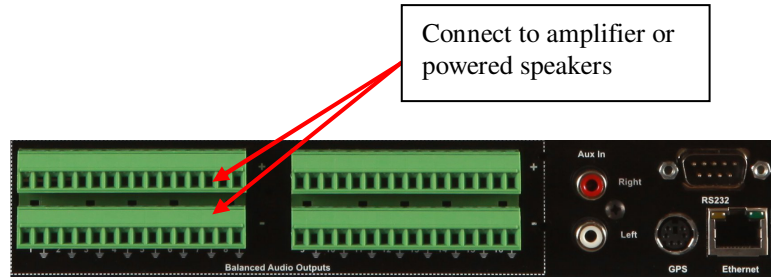
- ProTraXX Multichannel Audio Player (with CF card installed)
- ProTraXX Manual
- Straight-through DB-9 Female to DB-9 Female serial cable
- Crossover Ethernet Cable
- Power Supply
- (4) 16-pin Phoenix type connectors for rear audio outputs
- (4) 8-pin Phoenix type connectors for rear control inputs



# Playing a Test Sound

Every ProTraXX comes with a Compact Flash card preloaded with test sounds already installed in the unit's compact flash slot. To play test sounds, follow these step-by-step directions.

- Connect a channel of the ProTraXX to a set of powered speakers or to the input to an amplifier.



- Power the ProTraXX using the included power supply. The LCD display will indicate that the ProTraXX is initializing, and then display its current status when it's finished.
- When the ProTraXX has finished initializing, press the front panel channel pushbutton corresponding to the channel you connected the amplifier to. You should hear the test sound playing.

# Front Panel Controls and Indicators

The ProTraXX includes controls to accommodate a wide variety of installations. The front panel incorporates a 2x16 LCD display and Menu Knob, a blue power indicator, sixteen channel control pushbuttons, a Mute pushbutton, media status/error indicator, a GPS status indicator, channel status and rear input indicators, and a Compact Flash slot. All front panel controls can be locked using a PIN number for systems requiring tamper-free operation.



## Test Channel Buttons

*The numbers next to the test button match the channel and file numbers (i.e. Button number 1 plays file number 1 to channel 1, Button number 2 plays file number 2 to channel 2, etc.*

The front panel contains a row of sixteen pushbuttons. These buttons allow you to test play each of the unit's 16 mono channels. When a test channel button is pressed, the file with the same number as the button number will be activated and played out the corresponding channel. Pressing a button once plays the sound. Pressing it again while the sound is playing stops playback.

## Channel Status LEDs

Front Panel Channel Status LEDs activate whenever a channel is playing (Green) or muted (Red) or paused (Orange).

## Input LEDs

Input LEDs will illuminate Green whenever the corresponding rear panel input is activated.

## Mute All Button

A pushbutton on the far right of the front panel causes all channels to mute. Pressing the button once causes all channels to mute. Pressing it again causes all channels to unmute.

## File Access LED



This LED is primarily used to indicate Compact Flash media activity. It illuminates green whenever the Compact Flash media is being accessed. The LED will turn Red if an error condition exists.

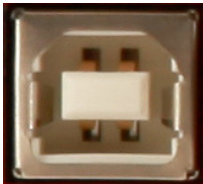
File Access LED Behavior	File Access LED Color	LED Meaning
Off	Off	Idle
On	Green	Media activity (Playing, file transfer, etc.)
On	Red	Media Error
On	Orange	Firmware Update (erasing Flash)
Flashing	Green	Firmware Updating
Flashing	Red	Firmware Update Error

## GPS Status LED



The LED located directly above the File Access LED is used to indicate GPS status. It will be red when any data is being received from the connected GPS antenna, and will turn green when a lock is established and the incoming data is valid.

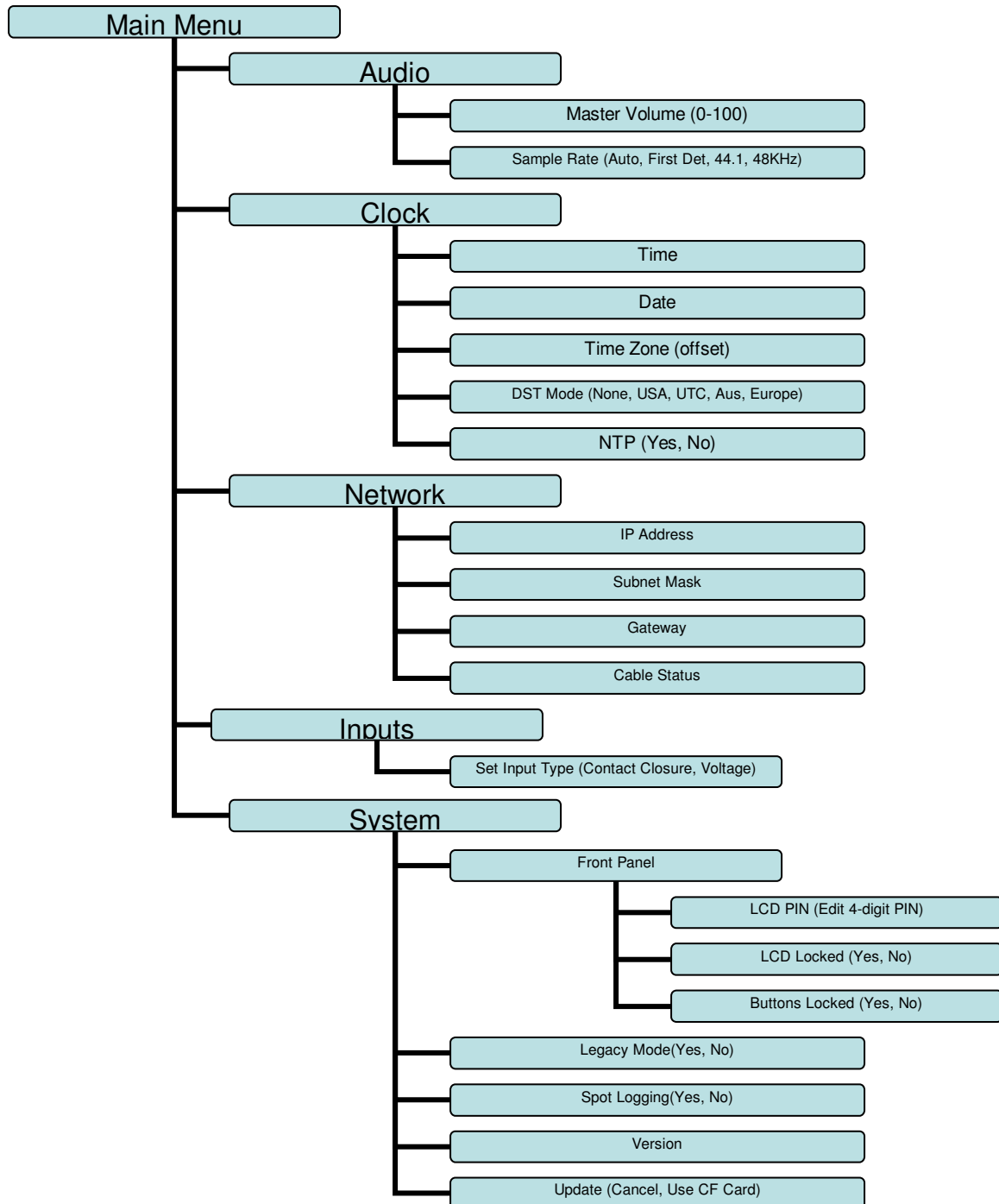
## USB



ProTraXX includes a female type-B USB connector on its front panel. This port can be used to control ProTraXX, using its standard command set, as a USB serial device. While many operating systems will detect and install the driver automatically, some operating systems such as Windows 7 64-bit will need the user to supply the appropriate driver. This driver is available from our website, at <http://www.alcorn.com>.

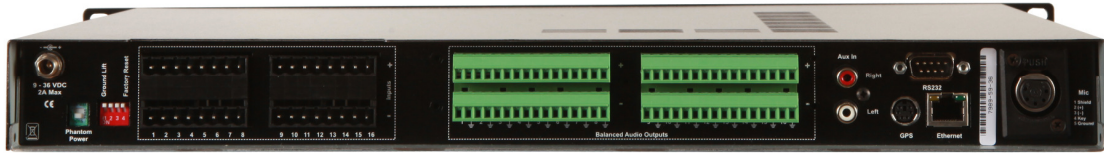
## LCD and Menu Knob

The Menu Knob is used to navigate through an LCD menu used to configure the operational parameters of the ProTraXX. Details of each of these parameters are explained in the sections that follow.



# Rear Panel Controls and Connectors

The rear panel includes Phoenix type connectors for 16 mono channels of balanced audio outputs, parallel control inputs, configuration DIP switches, microphone phantom power dipswitch, serial control connector, 6-pin mini-DIN GPS connector, RJ45 network jack, stereo line inputs, 5-pin XLR microphone connector, and the power input jack:



## Audio Outputs

Phoenix type screw terminals supply analog line-level balanced audio suitable for connection to a multi-channel amplifier or powered loudspeakers.

## Discrete Control Inputs

Sixteen discrete inputs can be programmed in a variety of ways to operate the unit. Please refer to the TraXX Configuration Software section for programming details. Each input can be individually configured for either contact closure or voltage input operation.

By default, the rear control inputs are configured to play files 1-16 to channels 1-16. For instance, input 3 will play file 3 to channel 3 when triggered. With the default input configuration, files will play and loop for as long as the input is maintained.

## RS-232C Serial Connector

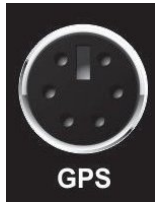
A serial cable is provided with each ProTraXX.

This input is a standard DB-9 male RS-232C connector, intended to be connected to a PC or control system using a straight-through (not null-modem) 9-pin cable. The pinout appears below. Please refer to the *Serial Protocol* section for a list of control commands.



Serial Connector Pinout	
Pin	Function
2	TXD (data from ProTraXX)
3	RXD (data to ProTraXX)
5	Ground

## GPS In



The 6-pin mini-DIN connector is used for GPS connection. When a valid GPS source is connected and satellite lock is achieved, ProTraXX will use the GPS time to set the system clock once an hour. While using GPS to sync the system clock, make sure the time zone and daylight savings time mode is properly set on the unit. The ProTraXX accepts a standard NMEA-0183 data stream at 4800 baud.

---

Note: NTP time update must be disabled for GPS time updates to occur. NTP can be enabled/disabled from the front panel menu.

---

## Microphone Input



This is a 5-Pin female XLR connector used to connect a microphone and push-to-talk (PTT) switch. The ProTraXX can route the microphone input to any channels or group of channels. See the section on “*Microphone Paging*” for additional details.

Microphone Input Pinout	
Pin	Function
1	Shield
2	Mic (+)
3	Mic (-)
4	PTT switch (key)
5	Ground

## Aux Line Input

The ProTraXX includes a stereo auxiliary line input. A line-level audio source connected to these two RCA jacks can be routed to any channels or group of channels using an Ethernet or Serial command. See the “*Line Input*” section of this manual for additional details.

## Ethernet RJ-45

*UDP control uses port 2638.*

*FTP uses TCP ports 20, 21.*

*NTP uses UDP port 123.*

This is a standard RJ-45 jack used to connect the ProTraXX to a network. Control (UDP), file transfer (FTP), and time (NTP) protocols are supported. Network settings can be configured using the front panel menu.

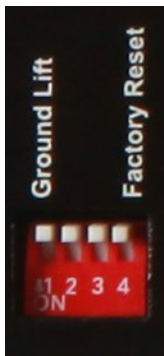
## Configuration DIP Switches

Four small DIP switches near the power connector are used to configure the unit.

DIP Switch Operation		
Number	On	Off
1	Ground Lift Enabled	Ground Lift Disabled
2	N/A	N/A
3	Firmware Recovery Mode	N/A
4	Reset to Factory Defaults	N/A

### ***Ground Lift (DIP 1)***

The Ground Lift feature can sometimes help in situations where audio hum or other noise is being caused by potential ground loops. A Ground Lift disconnects the internal ground from the ProTraXX's metal chassis, reducing the chance of ground noise affecting the ProTraXX's electrical systems (i.e. audio outputs/inputs, etc.). This feature is configured using switch #1 on the bank of DIP switches. By default, this switch is set to the OFF position which grounds the ProTraXX to its chassis. You can implement a ground lift by setting this switch to the ON position. After that, the ProTraXX's ground will be isolated from the chassis.



### ***Unused (DIP 2)***

This dipswitch is unused on ProTraXX.

### ***Firmware Recovery Mode (DIP 3, Unlabeled)***

This switch puts the ProTraXX in a recovery mode in which you can update the firmware. Use this mode to update to a working firmware version if a regular firmware update fails (due to power failure during update, corrupt firmware file, etc.)

### **Factory Defaults (DIP 4)**

Activating this switch returns the unit to its default (factory) state. These defaults are listed below.

Factory Defaults	
Parameter	Default Value
IP Address	192.168.0.254
Subnet Mask	255.255.255.0
Gateway	192.168.0.1
Nameserver (DNS)	127.0.0.1
NTP Server	pool.ntp.org
FTP User	admin
FTP Password	password
UDP Port	2638
RS232 Serial	9600 Baud, 8 Data Bits, No Parity, 1 Stop Bit
Buttons Enabled	Yes
LCD PIN	1111
LCD Locked	No
Master Volume	100
Legacy Mode	No
NTP	No
Spot Logging	No
Timezone Offset	0
Daylight Savings Mode	None
Control Inputs Mode	Contact Closure

### **Phantom Power DIP Switch**



Setting this DIP switch to the ON position enables phantom power (48V) on the microphone input.

Phantom power is on when the switch is up. In this photo, phantom power is turned off.



## Power

The power input is a 2.5x5.5x10mm threaded barrel connector with center pin (+) and the outer rim (-). The ProTraXX requires 9-36VDC at approximately 2 Amps. An external 115 or 230 VAC power supply is provided with the unit.

# The Compact Flash Card

## Recommended Compact Flash Cards

Included with your ProTraXX is a pre-formatted Compact Flash card. The formatting is a standard Microsoft FAT32 format, and any other card you use should be formatted as FAT32 using a PC.

Alcorn McBride recommends SanDisk® brand of Compact Flash. For the latest list of compatible and recommended Compact Flash please visit:  
<http://www.alcorn.com/library/appnotes/HowMuchFlash/index.html>

## Supported File Formats

The ProTraXX plays MP3 files which are compliant to the following specifications:

Supported MP3 Formats	
Standard	MPEG-1 Part 3 (or simply, MP3) defined in ISO/IEC-11172-3
Channel Encoding	Mono, Joint Stereo, Stereo, Dual
Sample Rates	44.1KHz, 48KHz
Bitrates	32,48,56,64,80,96,112,128,160,192Kbps

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Note: When playing more than 8 files simultaneously, 128Kbps is the maximum supported bitrate.

---

# File Naming

*It is sometimes easiest to use the “numbered” style of file naming for MP3 files if you want to use the discrete inputs.*

*Details about Playlists and Schedules are contained in separate chapters of this manual.*

A specific file naming convention is used so that the ProTraXX can identify the file type, as well as associate the supported file types with a number. Here is a table showing the naming conventions based on the type of file that is being named:

File Type	File Naming Style
MP3 Audio File (numbered)	SNDnnnnn.MP3
MP3 Audio File (named)	any-filename.MP3
Playlist	PLYnnnnn.LST
Schedule	SCHEDULE.SCL

Files can be referenced in commands by their full filename or their file number. The file number is determined by the 5-digit ‘nnnnn’ portion of the file name. The ProTraXX supports files that are assigned numbers between 1 and 99999, so this part of the filename is always represented as **00001** through **99999**.

Just as an example, let’s say that you created an MP3 file that you want to associate as file #123. To do this, you would need to rename the MP3 file to SND00123.MP3.

The file number naming style is not needed if you plan to reference files in commands by their full filename.

The one exception to the numbering method is the schedule file. The ProTraXX only supports a single schedule, and therefore there is only one file name permitted for this file. As you can see in the table above, this filename is **SCHEDULE.SCL**.

---

Note: If you use the file numbering scheme, every file on the media must have a unique number in the file name, no duplications are allowed. If you have duplicate file numbers (i.e. two files associated as file #1), the ProTraXX would consistently choose only one of those files when told to play the associated number.

---

# Playback

## ***Interruptible versus Uninterruptible Operation***

In a play command, you can specify uninterruptible playback, meaning that repeated play requests will not cause the sound to start over from the beginning while playing. An example of where this might be used is in a museum kiosk, where a guest trips a break-beam sensor to start an audio presentation. The audio will continue playing through, even though the guest might continually trip the sensor while listening to the presentation.

If not specified otherwise in the play command, files play as interruptible, meaning that repeated play requests during playback will cause the sound to start over. An example of where this might be used is in a shooting gallery, where you want the sound to be heard every time a gun's trigger is pulled.

See the Command Protocol section for details on how to specify interruptible vs. uninterruptible mode in your commands.

## ***Stereo versus Mono MP3 Playback***

ProTraXX is capable of up to 16 independent mono channels, but can also be used to play stereo MP3 files. When specifying playback of a stereo MP3 in a command, play the file to a channel pair (P1-P8) rather than an individual channel (C1-C16). ProTraXX will automatically send the left channel of the MP3 to the odd channel in the pair, and the right channel to the even channel in the pair.

For example, sending command “myMonoFile.mp3”1C2PL would play the MP3 file to the Channel 2 output. The command “myStereoFile”P2PL would play to channel pair #2, containing channels 3 and 4, perfect for stereo files.

More details can be found in the *Command Protocol* section of this manual.

# Transferring Files via FTP

*The nameserver setting is used to resolve hostnames into IP addresses. If you will not be using domain names (for NTP server addresses, etc.) you need not change this value from the default.*

In addition to transferring the files to the ProTraXX's compact flash card directly with your PC, ProTraXX has a built-in FTP server allowing for quick file transfers over Ethernet.

Before using FTP, be sure that the network settings on your ProTraXX are configured correctly. Network settings can be configured using the front panel menu of your ProTraXX. The default network settings are listed below.

IP Address	192.168.0.254
Subnet Mask	255.255.255.0
Gateway	192.168.0.1
Nameserver (DNS)	127.0.0.1
FTP User	admin
FTP Password	password

# Additional Features

## Microphone Paging

Using the rear microphone input of ProTraXX, you can page to any channel, channel pair, or channel group. The channel/group of channels that ProTraXX will route the microphone to is called the **paging zone**. The paging zone can be changed with an Ethernet or serial control command, or a command triggered by a rear input. Paging can be triggered by any input, including the push-to-talk input on the ProTraXX's 5-pin XLR mic input.

Because of the flexibility of ProTraXX commands, you could select your current paging zone with a command sent from a show controller, a local button box connected to the rear inputs configured as contact closure, a PLC triggering the rear inputs via voltage input, or, depending on the complexity of your application, all three. This technique can be used to allow the person doing the paging to choose exactly where their page will be routed.

Paging is started and stopped with a control command or you can choose a **paging trigger**. The paging trigger is a front panel button, rear input, or mic push-to-talk input that initiates paging while active and returns channels to their previous source when released.

While paging over a channel currently playing an MP3, the MP3 will be paused. Once paging concludes, it will resume from the exact point it was at when paging started.

For a complete listing of available paging commands, see the *Command Protocol* section of this manual.

---

Note: Paging zones and triggers cannot be changed while currently paging.

---

## Line Input

ProTraXX includes an auxiliary stereo line input on RCA connectors located on the rear of the unit. You can use this input to connect any external audio source (such as a phone, mixer, computer, etc.) Like microphone paging, this input can be routed to any channel or group of channels with a standard ProTraXX command from Ethernet, Serial, or any rear input or front panel button. Unlike microphone paging, the Line Input does not activate on a special "trigger", but is started and stopped with control commands, much like an MP3 file. For the complete command format, see the *Command Protocol* section of this manual.

## Spot Logging

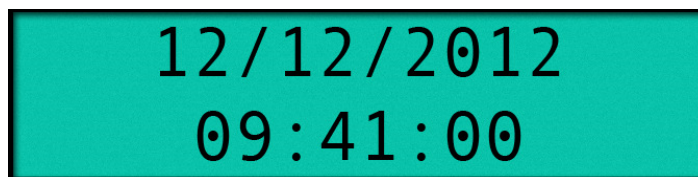
ProTraXX includes spot logging capability which records the time and date when a file is played. This log data is saved to the Compact Flash as a comma-separated values file, viewable in any spreadsheet program or text editor. The file will be named “log.csv”.

The maximum file size of the log file is 2Mb. Once your log file reaches this size limit, it will be renamed “log\_old.csv” and a new “log.csv” file will be started. Once the new “log.csv” reaches the size limit, it will replace the current “log\_old.csv”. This means that at any one time, ProTraXX can have up to 4Mb of log data on its compact flash card. Depending on the length of your filenames, this is approximately 100,000 entries.

## LCD Status Display

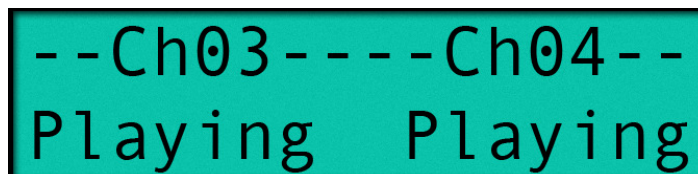
You can choose from three different home screen status displays via the LCD menu on ProTraXX. Entering the main menu and choosing System->Panel->Home Screen, you can choose from *Clock*, *Ch. Status*, and *All Ch. Status*. ProTraXX defaults to the *Ch. Status* home screen.

**Clock:** Displays the current system time.



12/12/2012  
09:41:00

**Ch. Status:** Cycles through the channel pairs, showing the current status as one of the following: (Playing, Stopped, Paused). The currently displayed channel pair changes every 3 seconds - turning the menu knob will scroll through the channels.



--Ch03---Ch04--  
Playing Playing

**All Ch. Status:** Displays the status of every channel on the screen at once as one of the following letters: (P, S, A), corresponding to Playing, Stopped, and Paused. Channels are listed 1-16 from left to right.



-Channel Status-  
P P P P P S S P P P A A P P P P

# Control Methods

For your convenience, Alcorn McBride distributes an application called **AMI Terminal**, which allows you to control the ProTraXX via RS-232 or Ethernet with the click of a button. This free application can be obtained at <http://www.alcorn.com/support/software.html>.

## Serial Control

The ProTraXX can be controlled using the male DB-9 RS-232 connector on the rear panel. If you are interfacing to the unit with a PC or other type of controller, you will need to use a straight-through DB-9 Female to DB-9 Female serial cable. For your convenience, this cable has been included with your ProTraXX.

This serial interface operates at **9600 baud, no parity, 8 bits per character, and one stop bit (9600,8,N,1)**.

All serial commands are ASCII based, and **are terminated with a carriage return** (hexadecimal value 0x0D). The complete list of supported commands can be found in the **Command Protocol** section of this manual.

## Ethernet Control

The ProTraXX is equipped with an Ethernet interface that allows you to control the unit using a standard Ethernet Protocol called UDP (User Datagram Protocol).

UDP is a very simple Ethernet protocol that allows an Ethernet device to transmit a generic string of data to another Ethernet device. Since UDP is such a common standard, UDP packets can be generated easily by a large variety of controllers and PC applications. The UDP packet handles all of the complexities of getting the message where it needs to go in one piece. The good news is that you do not have to understand those complexities. As a matter of fact, you only need to know the following information to send a UDP message.

1. **Destination IP Address** – This needs to be the IP address of the ProTraXX you intend to control. The default IP address of the ProTraXX is **192.168.0.254**.
2. **Destination Port** – This value needs to be the UDP port that the ProTraXX is listening to for UDP commands. This value is always **2638**.
3. **Source Port** - This is the UDP port the PC or controller will use to send the UDP message. It does not matter what port you choose, as long as it is a legal UDP port. If you have no idea what a legal UDP port is, just use **2638**.
4. **Data** – This is the actual message that you are sending to the ProTraXX. This message needs to be a **Command Protocol** message (i.e. 5C1PL<CR>).

All UDP commands are ASCII based, and **are terminated with a carriage return** (hexadecimal value 0x0D). The complete list of supported commands can be found in the **Command Protocol** section.



# Discrete Input Control

The ProTraXX has a total of 16 discrete inputs on the rear of the unit each of which individually configured to accept Voltage Input (12-24VDC) or Contact Closure. Voltage Input or Contact Closure for each input can be configured using *TraXX Config*, the TraXX configuration software.

When configured for contact closure, an input is triggered when a connection is made between the positive and negative terminals of that input. No external power supply is needed, so a simple switch or button wired between the terminals can be used to trigger the input. Contact Closure should not be used over long distances, anything over 15 feet should use inputs configured for Voltage Input.

When ProTraXX is configured for voltage input, an external power supply should be used to provide a 12-24vdc signal to the ProTraXX. Voltage Input can trigger from much longer distances than contact closure and because the inputs aren't sharing the power supply of the ProTraXX (as with contact closure), the wiring can be further isolated.

When triggered, inputs execute whatever standard control command has been assigned to them. TraXX Config, the configuration software for your ProTraXX, can be used to assign commands (such as play, stop, etc) to your ProTraXX's discrete inputs. See the **Command Protocol** section of this manual for a list of supported commands.

By default, the rear control inputs are configured to play files 1-16 to channels 1-16. For instance, input 3 will play file 3 to channel 3 when triggered. With the default input configuration, files will play and loop for as long as the input is maintained.

## Input Groups

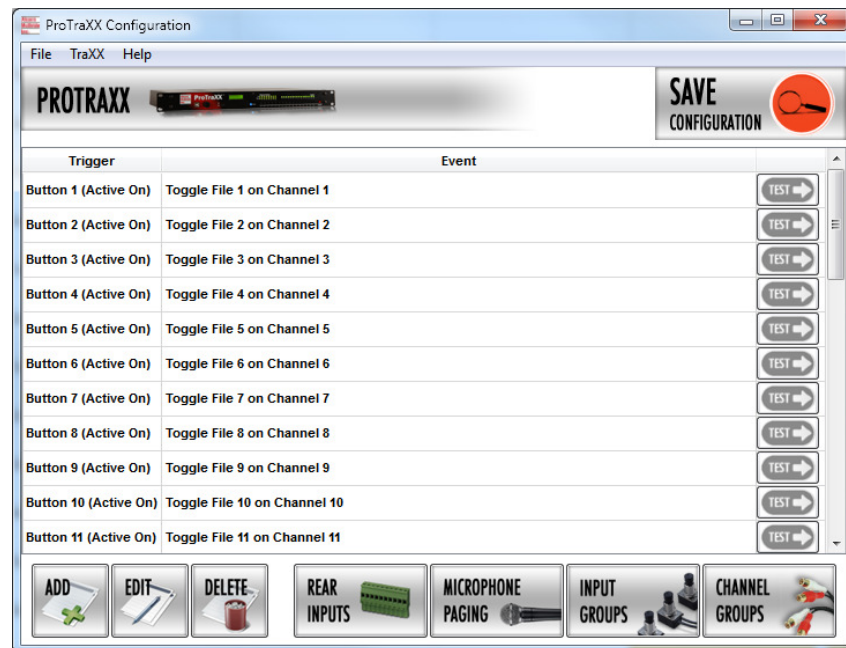
If you need more than 16 discrete inputs for your application, you can set up an Input Group. Input Groups are an advanced feature of ProTraXX that allows you to use combination of inputs to trigger up to 65,536 different actions. Once you use the TraXX Config software to add inputs to a group, the input group can be assigned to respond to different combinations of inputs triggered simultaneously.

For example, if you add all 16 inputs to input group 1, you can assign commands to respond to the 65,536 different 16 bit numbers created by the combinations of inputs.

# TraXX Configuration Software

TraXX Config can be downloaded from <http://www.alcorn.com/support/software.html>

TraXX Config allows you to easily group inputs together, assign them to specific playback or operational commands, and configure them for active-on or active-off operation.

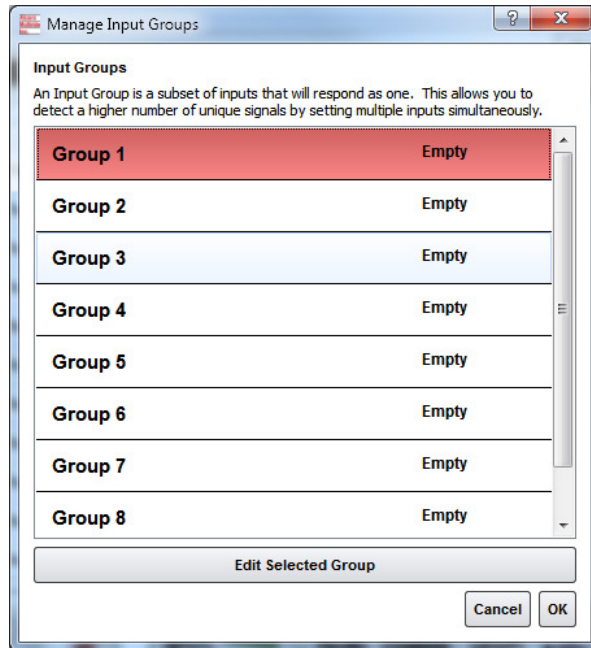


## Manage Input Groups

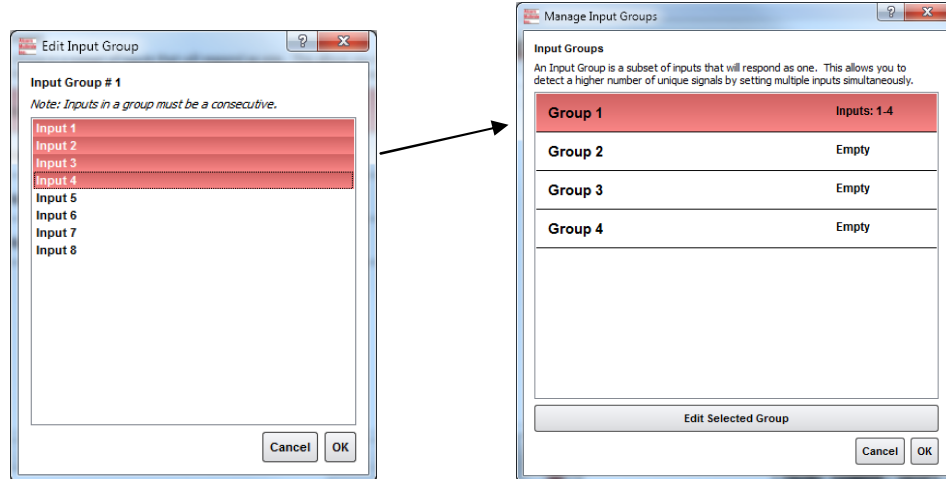
By default, the 16 discrete inputs on the ProTraXX act individually and are constrained to a total of 16 separate operations – one for each input.

However, if you need to perform more than 16 operations using the parallel inputs, you can combine the 16 inputs into “Input Groups” so that they can be activated using binary codes to achieve up to 65,536 operations.

In the TraXX Config program select *Manage Input Groups* to open this window:



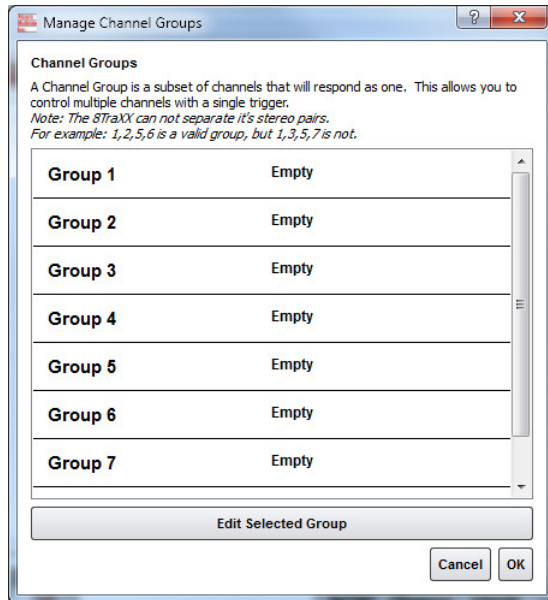
Select one of the Groups and click *Edit Selected Group* to assign inputs to that group. For this example we have assigned Inputs 1-12 to Group #1. Click *Save* to save the assignments.



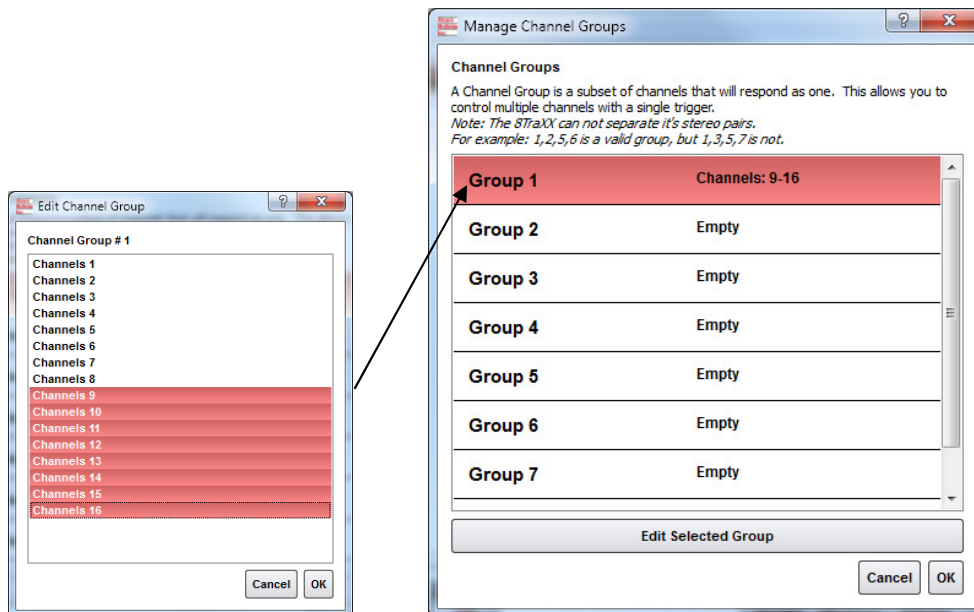
## Manage Channel Groups

You can have a total of 13 *Channel Groups* in the ProTraXX. Channel Groups allow you to control multiple audio channels using a single input or Serial/Ethernet command.

In the TraXX Config program select *Manage Channel Groups* to open this window:

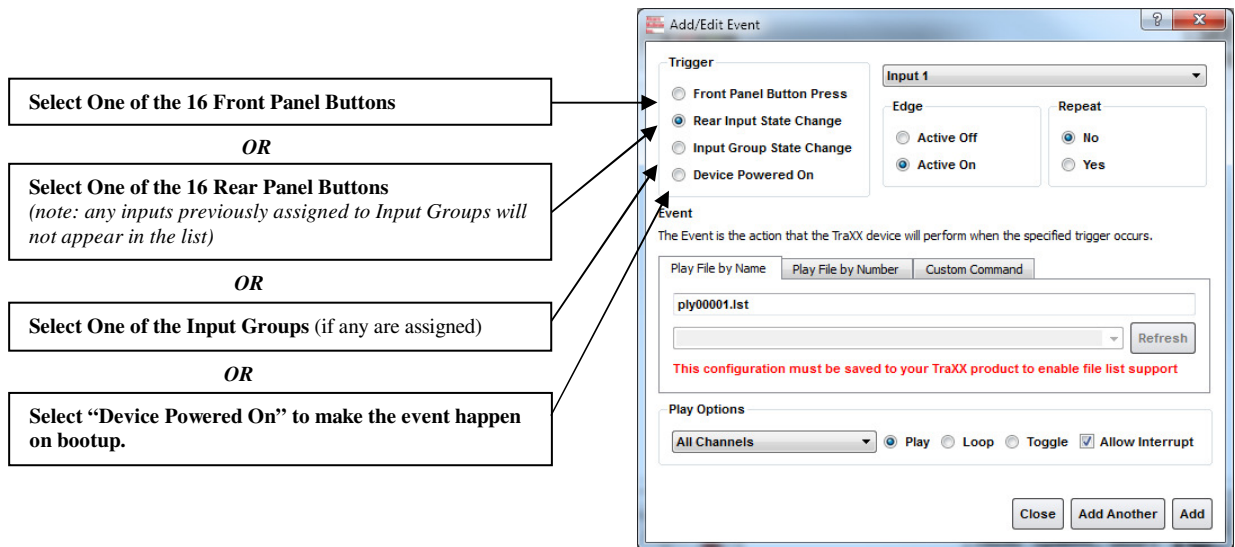


Select a Group and click *Edit Selected Group* to assign channels to that group. For this example we have assigned channels 9-16 to Group #1. Click *Save* to save the assignments.



## Add/Edit Event

Now for the fun part! Click on *Add* to add a trigger event to one of the inputs, buttons, or input groups. The Add/Edit Event window will appear.



**The best way to make the ProTraXX to play a file on startup is to select the *Device Powered On* Trigger Type.**

Once you have chosen where the event is being triggered from, you can select either an *Active On* or *Active Off Trigger Edge*. This allows the ProTraXX to respond to either normally-open or normally-closed input sources.

In the *Event* field you specify exactly what action you want the Event to perform. You can have it play a file or you can specify a *Custom Command*, where you can use any command out of the Command Reference in this manual.

*The Configuration File is named "CONFIG.LST" which the ProTraXX always loads on startup.*

Click *Add* once you've finished making your choices and the trigger will be added to the ProTraXX configuration file.

Now you need to save your file. To do this select *File...Export Configuration...* and choose the destination. You can copy it to your hard drive and then copy it to the ProTraXX Compact Flash and insert it into the unit.

# Playlist Control

*You can have a total of 17 simultaneously-running playlists in the ProTraXX. One system playlist plus one per channel..*

Playlists provide a mechanism for the ProTraXX to automatically execute commands in a predefined sequence. Since Playlists can execute any of the commands listed in the **Command Protocol** section, they can perform a variety of functions. These functions could be something as simple as looping a single channel or groups of channels, or as complex as user-initiated pacing of playback.

## Overview

*For an easy way to make a playlist, use **Playlist Builder** described on Page 33 and available at <http://www.alcorn.com/support/software.html>*

*A playlist zero (PLY00000.LST) will automatically play on power-up.*

*It is not a good idea to have both a playlist file and an audio file with the same number (like PLY00002.LST and SND00002.MP3). If you do, commanding the ProTraXX to play file #2 may not produce the desired result (whatever that may be) since the ProTraXX is forced to prioritize which file type it should play in that circumstance.*

**A playlist file is nothing more than a list of ProTraXX commands listed in a text file.** These commands, which are listed in the **Command Protocol** section, are the same commands that are used by all of the ProTraXX's control interfaces. Although any of the supported commands can be used, playlists usually contain **Play** commands, which cause the ProTraXX to play audio clips from the Compact Flash card. When a playlist is being used, the commands are processed in the order in which they appear in the list. The playlist is an ASCII text file and can be made using any ASCII text editor (like notepad) or using the Playlist Builder program available from <http://www.alcorn.com/support/software.html>.

Each channel pair of the ProTraXX can have its own independent playlist. There is one additional system playlist that is not tied to any particular channel.

Playlists are triggered the same way as sound files - by Serial or Ethernet commands, or with discrete inputs. The system playlist is started by a **PL** command and the individual channel pair playlists are started with **PO** commands.

For example, the following serial command would start the playlist file "ply00002.lst" as the system playlist:

**2PL**

The following command would start the playlist file "ply00004.lst" as the channel 5 playlist:

**4C5PO**

It is a very common requirement in applications for the ProTraXX to power up and launch a playlist on its own. This can easily be done by naming the playlist file **PLY00000.LST**. This filename directs the ProTraXX to play the file as the system playlist upon power up.

It is also common practice to have one playlist launch another playlist. This is done in the same fashion as playing an audio file; by using a command like **2PL** (where 2 is the number of another playlist).

## Special Playlist Commands

In addition to regular ProTraXX commands listed in the **Command Protocol** section, there are a few additional commands for the Playlist Control interface. These single-character commands further modify the behavior of the playlists to provide additional features that only apply to the Playlist Control interface of the ProTraXX. These characters and their functions are listed in the following table:

Command	Description
<b>W</b>	Wait. Playlist pauses in the current position until another 'Play' command occurs, at which time it resumes processing of the playlist. This is useful for applications where a user interactively controls the progression of play.
<b>&lt;</b>	Loop. Tells the playlist to loop upon completion. This looping will continue indefinitely until a Stop condition occurs, or another audio or playlist file is played on that channel.
<b>;</b>	Comment. Ignore all characters until the next line.

Commands may be entered into the Playlist in either upper or lower case. All text following a semicolon (;) is interpreted as comments, until the next line in the file. You may put anything you want in comments, including the special command characters normally used in the Playlist.

## Example Playlist

Here's an example playlist that will be discussed in detail below to explain the concept of how playlists work in the ProTraXX.

```
1C1PL ;You can comment your Playlist file by using
6P2LP ;semicolons. All text after a semicolon is
3G2PL ;ignored until the end of the line where a
      ;carriage return is encountered.
5P1PL
<
```

The first command, which is “**1C1PL**”, causes the ProTraXX to play file #1 to channel #1. If the user issues a Play command during the playback of file #1, it will be interrupted and the playlist will move on to the next command. If a Play command is not received, the ProTraXX will not advance to the next playlist command until file #1 has played to completion.

When file #1 has finished playing, the “**6P2LP**” command is executed. This command causes the ProTraXX to loop file #6 continuously to channel pair #2. This file will continue looping indefinitely until the user issues a Play command to advance the playlist.

If advanced by the user, file #3 plays to channel group #2 followed by file #5 playing to channel pair #1. Once file #5 finishes, the “<” character causes the playlist to loop back to the beginning. This means that file #1 will start playing once again.

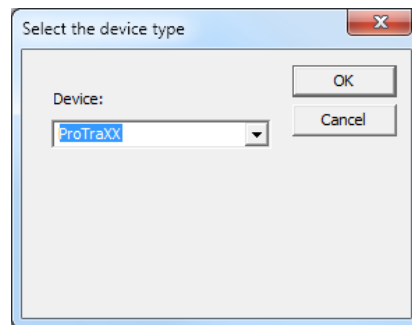


## Playlist Builder

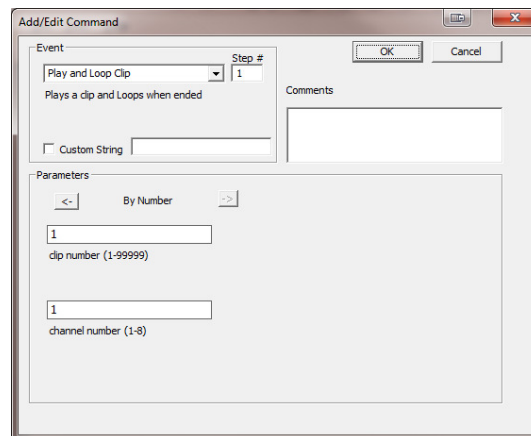
For convenience, Alcorn McBride provides a free Windows application for making playlists using a graphical interface. This program is called Playlist Builder, and it can be downloaded from the software section the Alcorn McBride website at <http://www.alcorn.com/support/software.html>

Here is a step-by-step guide to get started making playlists with Playlist Builder.

1. Open the Playlist Builder application
2. Select “ProTraXX” in the list of supported devices and click OK.



3. Select the event you wish to insert into the playlist. For this example we'll choose “Play and Loop Clip”.
4. Using the arrows in the ‘parameters’ box, you can select which type of Play command you wish to use. For example, “By Number” would allow you to enter a clip number. “By File” would allow you to enter the actual file name. If you are using the compact flash card that shipped inside your ProTraXX, select ‘By Number’ and enter the number ‘1’ in the field.
5. Also choose which channel pair you would like the file to play to. For this example we will choose Channel Pair 1.
6. Click OK to add the event to the playlist



7. Add as many commands as you like! Once you are done, you can save the playlist file and transfer it to the ProTraXX Compact Flash card!

# Scheduler Control

*For an easy way to make a schedule, use **Schedule Builder** available at <http://www.alcorn.com>*

*If you plan on using the Scheduler, you should verify that the ProTraXX's time, date, timezone, and daylight savings mode are set correctly.*

The ProTraXX has a built-in real-time clock, which can be used to trigger events based on time and/or date. For example, a schedule could be created to play a sound at exactly 3:00PM on January 15th 2015, or start looping a sound at 8AM every morning and stop looping it at 8PM every night.

The ProTraXX can accomplish this type of task using a feature called the **Scheduler**. With a user-created schedule file, the Scheduler can execute any event listed in the **Command Protocol** section of this manual. These scheduled events are accurate down to the minute, and can be programmed to execute once, or repeat periodically (i.e. repeat every Monday, every January 1<sup>st</sup>, every morning, etc.).

The ProTraXX obtains schedule information from a file on the Compact Flash card named **schedule.scl**. This file is created using either a text editor (i.e. Notepad) or a free Alcorn McBride application called **Schedule Builder**. The remainder of this section contains information on how to make this schedule file using either method.

## Schedule File Format

The **schedule.scl** file itself is nothing more than a formatted ASCII text file. In this file, each line contains a ProTraXX command as well as data fields that specify when that command should be executed. This section covers these fields and how they are used to schedule command execution.

### Field Summary

Here is a list of the fields that can be used within a scheduled event. Below this table, there are several examples that show how these fields can be used to change the behavior of a scheduled event.

Delimiter	Field
<b>T:</b>	Starting time (hh:mm) (military time – leading zeros for hours required)
<b>D:</b>	Starting date (mm/dd/yy or mm/dd/yyyy . You can use periods, slashes, or dashes to separate dates)
<b>I:</b>	Ending time (hh:mm) (military time)
<b>A:</b>	Ending date (mm/dd/yy or mm/dd/yyyy . You can use periods, slashes, or dashes to separate dates)
<b>E:</b>	Event – This field always contains the COMMAND event
<b>1:</b>	Parameter 1 – This always contains the ProTraXX command wrapped in quotes.
<b>R:</b>	Repeat Number: repeat after this number of periods has expired
<b>P:</b>	Repeat Period: Time to wait between executions, used with Repeat Number and Set when necessary
<b>S:</b>	Repeat Set: special case usage described below

;	Although not a field, this marks a comment
---	--------------------------------------------

### **Example 1**

T:13:46 D:01/1/2015 E:COMMAND 1:"1C12PL"

This is the simplest possible example because it contains the minimum number of fields needed to execute a scheduled event. Notice that the example occupies only one line of text, and that each field is separated by a space. In order, this is exactly what each field means.

**Start Time(T):** 1:46pm in the afternoon (**13:46** military)

**Start Date(D):** January 1<sup>st</sup> 2015

**Event(E):** COMMAND – Specifies that parameter 1 contains a ProTraXX command

**Parameter 1(1):** The command string “1C12PL” will cause the ProTraXX to play file #1 to channel #12.

### **Example 2**

T:14:46 D:01/1/2015 E:COMMAND 1:"C12RJ" ;Stop CH 12  
Playback

Two things have changed in this example.

**Start Time(T):** 2:46pm in the afternoon (**14:46** military)

**Start Date(D):** January 1<sup>st</sup> 2015. (same as Example 1)

**Event(E):** COMMAND (same as Example 1)

**Parameter 1(1):** The command string “C12RJ” will cause the ProTraXX to stop playback on channel pair 2.

Using Example #1 and Example #2 together in a schedule file will cause file #1 to begin playback at 1:46PM on January 1<sup>st</sup>, 2015 and stop playback at 2:46PM the same day.

One other thing that is special about this event is that the comment “**Stop Playback**” has been added at the end of the line using a semicolon(;). **Anything found after a semicolon is ignored by the scheduler.** You can even place a comment on its own line, if you like.

### **Example 3**

T:14:46 D:01/1/2015 R:30 P:minute A:1/3/2010 I:3:00  
E:COMMAND 1:"1P2PL"

We've now added:

**Repeat Number(R):** 30

**Repeat Period(P):** minute

**Ending Time(I):** 3am in the morning (**3:00** military)

**Ending Date(A):** January 3<sup>rd</sup> 2015

The **Repeat Number** acts as a multiplier of the **Repeat Period**. They should be read in conjunction like this: "**Repeat this event every 30 minutes**".

The **Ending Time** and **Ending Date** fields specify the time and date that the repeating will stop. In this example, the ProTraXX will play file #1 to channel pair 2 on 1/1/2015 at exactly 2:46PM. It will then play the file again 30 minutes later (3:16PM) and will continue to repeat until 3:00AM on 1/3/2010.

### **Example 4**

T:1:00 D:11-28-2015 R:4 P:Thursday S:November E:COMMAND  
1:"1P2PL"

The only thing that is new with this example is the **Set** field:

**Repeat Set(S):** November

A **set** defines a certain range of valid repeat periods. For this example, only the Thursdays in November are eligible for this event. When a **Set** is used in an event, the **Repeat Number** takes on a different meaning. Instead of being a multiplier of the **Repeat Period**, **it and the Repeat Period become an index of the set**. These three fields should be read in conjunction like this: "**Repeat this event every 4<sup>th</sup> Thursday in November.**"

## ***Fields in Detail***

There is a summary table in the **Scheduled Events** section that lists all the fields for your reference. Since the **Command Event**, and **event Parameter** fields have been discussed, we'll discuss the rest of the fields here.

### ***T: Start Time***

The **Start Time** is the hour and minute your event becomes active. For most cases being active simply means gets executed. You can specify it in military or standard time where 00:00 is midnight, 23:59 or 11:59pm is last minute of the day something can be scheduled. You can also specify **sunrise** or **sunset**. In order to take advantage of sunrise/sunset calculations

in the ProTraXX, you need to determine you longitude, latitude, and time zone. All three of these settings can be configured remotely using the **Command Protocol** of the ProTraXX.

**Example:**

T:13:30  
T:Sunrise  
T:Sunset

### ***D: Start Date***

The Start Date is the month, day, and year your event becomes active. For most cases being active simple means gets executed. You specify it in a variety of ways. You can use periods, slashes, or dashes to separate the fields of the dates. Dates from the year 2000 to the year 2099 are supported. Leap years are handled automatically.

**Examples:**

D:01.01.2001  
D:01/01/2001  
D:01-1-2001

### ***I: End Time***

The End Time is the hour and minute your event stops being active. See the T: Start Time section for syntax.

**Examples:**

I:1:30  
I:Sunset  
I:Sunrise

### ***A: End Date***

The End Date is the month, day, and year your event stops being active. See the D: Start Date section for syntax.

**Examples:**

D:01.01.2001  
D:01/01/2001  
D:01-1-2001

### ***R: Repeat Number***

The Repeat Number acts differently depending on what other fields it is used with:

- With no Repeat set field present.
- With a Repeat Set field present.

#### **1. With no Repeat set field present:**

This is the most common usage of the Repeat Number. It acts as a multiplier of the Repeat Period. They should be read in conjunction like this: **“Repeat this event every <repeat number> <repeat period>”**.  
Ex. “Repeat this event every 30 minutes”.

The repeat number can be anywhere from 1 to over 4 billion. You can specify repeating a number of minutes, which is why this is so huge. Realistically though, you would specify repeating in years, if it got that large. Whatever combination you choose between Repeat Number and Repeat Period should not multiply out to be greater than a century.

**Example:**

R:1 ;do it every period  
R:117 ;do it every 117 periods

**2. With a Repeat Set field present:** The Repeat Number and the Repeat Period become an index of the set. These three fields should be read in conjunction like this: **“Repeat this event every <repeat number> <repeat period> in <set>.”** Ex. “Repeat this event every 4<sup>th</sup> Thursday in November.”

Although there are many possibilities, we can use an example of holidays to explain what using a set can do for you. Over the period of a year, you may want to schedule events for some holidays. Unfortunately, not all holidays land on the same date every year. By defining a set, along with the repeat number and repeat period, you can choose the first Monday of the month, or whatever you like. Sets can be specific or general.

**Example:**

R:2 P:Sunday S:May E:Command 1:"1P1PL" ;Every 2<sup>nd</sup> Sunday in May  
Play file #1 to channel pair 1.  
R:1 P:Day S:Month E:Command 1: "2P2PL" ;Every 1<sup>st</sup> day of every month  
play file #2 to channel pair 2.  
R:2 P:Day S:Month E:Command 1: "4P4PL" ;Every 2<sup>nd</sup> day of every  
month play file #4 to channel pair 4.  
R:3 P:Day S:Month E:Command 1: "5P5PL" ;Every 3<sup>rd</sup> day of every month  
play file #5 to channel pair 5.  
....

## ***P: Repeat Period***

The Repeat Period defines how long to wait. It is multiplied or indexed according to the presence of a Repeat Set field. (See the Repeat Set and Repeat Number sections for details)

**Periods can be one of the following:**

Sunrise, Sunset  
Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday  
Minute  
Hour  
Day  
Year

**Notes:** Month is not a valid period. If you want to make a monthly schedule, use a combination of repeat number, period and set to do so. See the example in the Repeat Number section for details. You can also specify **sunrise** or **sunset**. In order to take advantage of sunrise/sunset calculations in the ProTraXX, you need to determine your longitude, latitude, and time zone. All three of these settings can be configured remotely using the **Command Protocol** of the ProTraXX.

**Examples:**

R:Sunday

R:year

R:sunset

***I: Repeat Set***

Using the Repeat Set field changes the way Repeat Number and Repeat Period operate. Together they act as an index into the Repeat Set. Please read the Repeat Number section above, for a detailed explanation of the different behaviors they take on when the Repeat Set field is present.

For example, in order to create a monthly schedule, you can specify the Repeat Set as **month**.

**Sets can be one of the following:**

Month

January, February, March, April, May, June, July, August, September, October, November, and December

**Examples:**R:5 P:day S:month ;repeat 5<sup>th</sup> day of every monthR:2 P:Monday S:month ;repeat 2<sup>nd</sup> Monday of every monthR:4 P:Thursday S:November ;repeat 4<sup>th</sup> Thursday in November***Restrictions***

Since the Scheduler is very flexible, it is easier to explain what it cannot do, than to explain what it can.

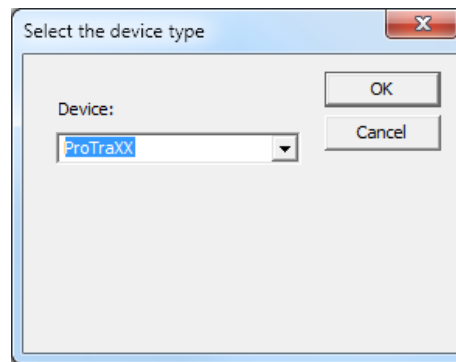
1. Whatever combination you choose between Repeat Number and Repeat Period should not multiply out to be greater than a century. For example, you can't repeat an event every 102 years.
2. One event executes per minute. If you want to execute more than one event, you should launch a playlist with the schedule event. Playlists can execute an unlimited number of commands once they are triggered.

## Schedule Builder

To make creating schedules more convenient, Alcorn McBride provides a free Windows application for making schedules using a graphical interface. This program is called **Schedule Builder**, and it can be downloaded from the software section the Alcorn McBride website at <http://www.alcorn.com/support/software.html>

Here is a step-by-step guide to get started making schedules with Schedule Builder.

1. Open the Schedule Builder application
2. Select the ProTraXX in the list of supported devices and click OK.



3. The Add/Edit Event window will appear automatically. This is where you select the event you wish to insert into the schedule. Since “Play and Loop Clip” is an event used to play an audio file, we will use it for this example.
4. Using the arrows in the ‘parameters’ box, you can select which type of Play command you wish to use. For example, “By Number” would allow you to enter a clip number. “By File” would allow you to enter the actual file name. If you are using the compact flash card that shipped inside your ProTraXX, select ‘By Number’ and enter the number ‘1’ in the field.



**Add/Edit your event**

Event: **Play and Loop Clip**  
Plays a clip and Loops when ended

Parameters:  
 clip number (1-99999): **1**  
 channel number (1-8): **1**

Comment:

Start Time:  
☒ Time: 2:29:58 PM  
☐ Sunrise  
☐ Sunset  
☐ Boot

Recurrence Pattern:  
☒ None  
☐ Daily  
☐ Weekly  
☐ Monthly  
☐ Yearly

Time Range of Recurrence:  
☒ No End Time  
☐ Time: 2:29:58 PM  
☐ Sunrise  
☐ Sunset

Date Range of Recurrence:  
☒ No End Date  
☐ Start: 11/ 4/2011 End By: 11/ 4/2011 ☐ Ignore Year

5. Select the time and date you wish to execute the command in the Start Date/Time section on the right side of this screen.
6. If you only want the command to be executed once, just click OK. However, if you want the command to be repeated (say every hour or every day) you can specify that in the repeat box on the right side of the screen. For the sake of this example, we are going to repeat this command every hour.

**Add/Edit your event**

Event: **Play and Loop Clip**  
Plays a clip and Loops when ended

Parameters:  
 clip number (1-99999): **1**  
 channel number (1-8): **1**

Comment:

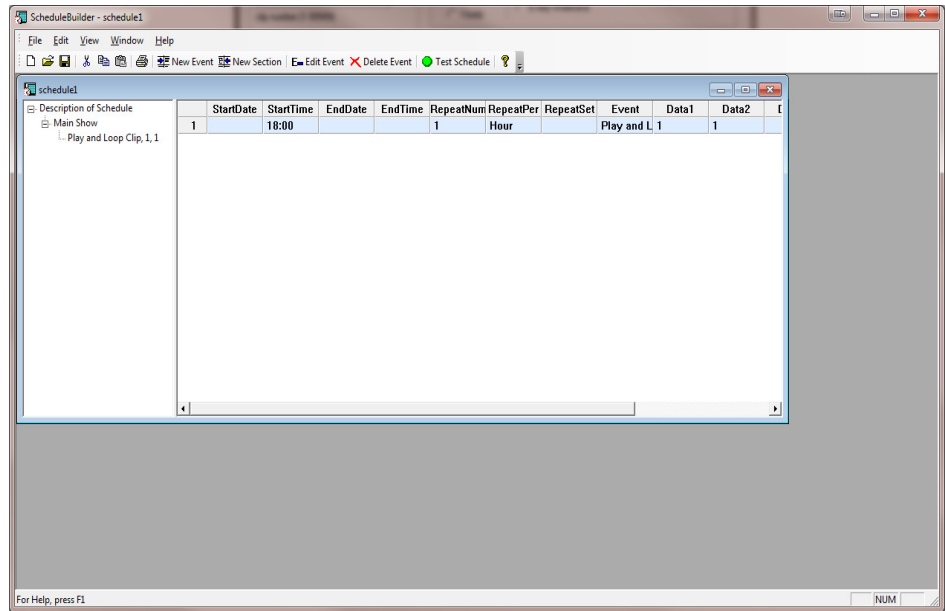
Start Time:  
☒ Time: 6:00:00 PM  
☐ Sunrise  
☐ Sunset  
☐ Boot

Recurrence Pattern:  
☐ None  
☒ Daily  
☐ Weekly  
☐ Monthly  
☐ Yearly  
☐ Every Weekday  
☐ Every Weekend

Time Range of Recurrence:  
☒ No End Time  
☐ Time: 2:29:58 PM  
☐ Sunrise  
☐ Sunset

Date Range of Recurrence:  
☒ No End Date  
☐ Start: 11/ 4/2011 End By: 11/ 4/2011 ☐ Ignore Year

7. Click OK and the event will be added to the schedule.



8. In this screen, you are free to Add/Edit/Delete Scheduled events as needed.
9. Once you are finished creating the schedule, all you need to do is **save** the schedule file as **schedule.scl** and copy it to the ProTraXX's Compact Flash card.

# Command Protocol

The Serial, Ethernet, Playlist, and Scheduler control interfaces use the Pioneer Alcorn McBride Enhanced protocol. This protocol implements nearly all of the Pioneer Laser Disc player command set, but adds commands to access advanced features of the ProTraXX as well. This section discusses the most commonly used commands in detail.

The protocol is ASCII-based. Upper or lower case characters can be used interchangeably. **All commands and responses are terminated with the Carriage Return character. This character is represented by the hexadecimal value of 0x0D.**

Certain commands were added in later firmware releases. In this case, the minimum OS version is indicated. If no minimum version is indicated, the command has always been available. You can obtain the latest firmware version from our website at <http://www.alcorn.com>.

## Playback Commands

These commands control the playback operation of the ProTraXX. These commands can be directed at an individual **Channel, Channel Pair, or Channel Group**.

Channel Group numbers range from 1 to 13 and are always preceded by the letter 'G'. For example,

**G5** means Channel Group #5.

Channel Pair numbers range from 1 to 8 and are always preceded by the letter 'P'. For example,

**P4** means Channel Pair #4.

Individual Channel numbers range from 1 to 16 and are always preceded by the letter 'C'. For example,

**C3** means Channel #3

## Play - PL

Description:	This command causes the ProTraXX to play a sound file.	
Command Bytes:	<n><d><i>PL or "<filename>"<d><i>PL	
Parameters:	<p>&lt;n&gt; is the ASCII file number between 0-99999</p> <p>&lt;filename&gt; is the ASCII file name</p> <p>&lt;d&gt; is either <b>C</b> followed by a channel number in ASCII, <b>P</b> followed by a channel pair number in ASCII, or <b>G</b> followed by a channel group number in ASCII</p> <p>&lt;i&gt; is either <b>U</b> for uninterruptible playback or <b>I</b> for interruptible playback. This parameter is optional.</p>	
Message Response:	<b>R</b>	
Comments:	<p>If no sound number or filename is specified, the file specified with the last Search command (see below) will be used.</p> <p>Channel numbers range from 1 through 16, Channel Pairs from 1 through 8, and Channel Groups from 1 through 13. Use "*" for All Channels.</p> <p>This command can also start the system playlist or can be used to force a playlist to continue by using the '&gt;' character in place of a file number.</p>	
Examples:	<p>Play file 21 to Channel Pair 4. <b>21P4PL</b></p> <p>Play file 1 to Channel Group 12. <b>1G12PL</b></p> <p>Play file "music.mp3" to all channels. <b>"music.mp3"*PL</b></p> <p>Move the playlist on Channel Pair 1 to the next entry <b>&gt;P1PL</b></p>	

## Loop Play - LP

Description:	This command causes the ProTraXX to play a sound file, automatically looping it back to the start when the sound finishes.	
Command Bytes:	<n><d><i>LP or "<filename>"<d><i>LP	
Parameters:	<p>&lt;n&gt; is the ASCII file number between 0-99999</p> <p>&lt;filename&gt; is the ASCII file name</p> <p>&lt;d&gt; is either <b>C</b> followed by a channel number in ASCII, <b>P</b> followed by a channel pair number in ASCII, or <b>G</b> followed by a channel group number in ASCII</p> <p>&lt;i&gt; is either <b>U</b> for uninterruptible playback or <b>I</b> for interruptible playback. This parameter is optional.</p>	
Message Response:	<b>R</b>	
Comments:	<p>If no sound number is specified, the number specified with the last Search command (see below) will be used.</p> <p>Channel numbers range from 1 through 16, Channel Pairs from 1 through 8, and Channel Groups from 1 through 13. Use "*" for All Channels.</p>	
Examples:	<p>Play and loop file 21 to Channel Pair 4. <b>21P4LP</b></p> <p>Play and loop file 9 to Channel 3. <b>9C3PL</b></p>	

Play and loop file 1 to Channel Group 12.  
Play and loop file "music.mp3" to all channels

**1G12LP**  
**"music.mp3"\*LP**

## Play Toggle - PT

Description:	This command causes the ProTraXX to toggle playback of a file on the specified channel. If currently stopped, the file will play. If currently playing, the file will stop.	
Command Bytes:	<n><d><i>PT or "<filename>"<d><i>PT	
Parameters:	<p>&lt;n&gt; is the ASCII file number between 0-99999 &lt;filename&gt; is the ASCII file name &lt;d&gt; is either <b>C</b> followed by a channel number in ASCII, <b>P</b> followed by a channel pair number in ASCII, or <b>G</b> followed by a channel group number in ASCII &lt;i&gt; is either <b>U</b> for uninterruptible playback or <b>I</b> for interruptible playback. This parameter is optional.</p>	
Message Response:	<b>R</b>	
Comments:	If no sound number or filename is specified, the file specified with the last Search command (see below) will be used. Channel numbers range from 1 through 16, Channel Pairs from 1 through 8, and Channel Groups from 1 through 13. Use "*" for All Channels.	
Examples:	Play toggle file 21 to Channel Pair 4. Play toggle file 9 to Channel 3. Play toggle file 1 to Channel Group 12. Play toggle file "music.mp3" to all channels.	<b>21P4PT</b> <b>9C3PT</b> <b>1G12PT</b> <b>"music.mp3"*PT</b>

## Play Directory - PD

Description:	This command causes the TourTraXX to play the files located in a specified directory by automatically generating a playlist with the contents of the directory and starting the playlist on the specified channel, channel pair, or channel group.
Command Bytes:	<b>"&lt;dir&gt;"&lt;d&gt;&lt;options&gt;PD</b>
Parameters:	<p><b>&lt;dir&gt;</b> is the directory path. Leave blank with <i>no quotes</i> for root directory.</p> <p><b>&lt;d&gt;</b> is either <b>C</b> followed by a channel number in ASCII, <b>P</b> followed by a channel pair number in ASCII, or <b>G</b> followed by a channel group number in ASCII</p> <p><b>&lt;options&gt;</b> is one or more of the following:</p> <ul style="list-style-type: none"><li><b>A</b> – sort ascending</li><li><b>D</b> – sort descending (overrides ascending)</li><li><b>C</b> – sort case-sensitive</li><li><b>#</b> – sort by number</li><li><b>?</b> – randomize each directory (overrides all sorting options)</li><li><b>E</b> – embed playlists contained in directory into generated playlist</li><li><b>R</b> – recurse into subdirectories</li><li><b>L</b> – loop the directory by refreshing playlist at end</li></ul>
Message Response:	<b>R</b>
Minimum OS Version:	TraXXOS 1.3.0
Comments:	Channel numbers range from 1 through 16, Channel Pairs from 1 through 8, and Channel Groups from 1 through 13. Use "*" for All Channels.
Examples:	<p>Play all the files in the "sounds" directory, sorted by number, on ch pair 5. <b>"sounds"P5#PD</b></p> <p>Play all the files in the "music" directory, sorted ascending, on ch. 2. <b>"music"C2APD</b></p> <p>Play all the files in all directories, sorted randomly, on all channels. <b>*?RPD</b></p>

## Search - SE

Description:	This command causes the ProTraXX to preload a file to a specific Channel Pair or Channel Group. If the next Play or Loop command is sent without a sound number or file specified, the preloaded sound number specified by this command is used. This is especially useful for All Channel play commands, where you can leave the sound number unspecified, and the channel number is specified as '*'. The ProTraXX will start playback of all channels at the same time, using the assigned files for each channel specified by a previous Search command.	
Command Bytes:	<n><d><i>SE or "<filename>"<d><i>SE	
Parameters:	<n> is the ASCII file number between 0-99999 <filename> is the ASCII file name <d> is either <b>C</b> followed by a channel number in ASCII, <b>P</b> followed by a channel pair number in ASCII, or <b>G</b> followed by a channel group number in ASCII <i> is either <b>U</b> for uninterruptible playback or <b>I</b> for interruptible playback. This parameter is optional.	
Message Response:	<b>R</b>	
Comments:	Channel numbers range from 1 through 16, Channel Pairs from 1 through 8, and Channel Groups from 1 through 13. Use "*" for All Channels.	
Examples:	Search file 21 to Channel Pair 4.	<b>21P4SE</b>
	Search file 1 to Channel Group 12.	<b>1G12SE</b>
	Search file "music.mp3" to all channels	<b>"music.mp3"*SE</b>

## Pause - PA

Description:	This command causes the ProTraXX to pause playback of the specified Channel Pair or Channel Group. Playback is resumed whenever a Play command is issued to the paused Channel Pair or Channel Group	
Command Bytes:	<d>PA	
Parameters:	<d> is either <b>C</b> followed by a channel number in ASCII, <b>P</b> followed by a channel pair number in ASCII, or <b>G</b> followed by a channel group number in ASCII	
Comments:	Channel numbers range from 1 through 16, Channel Pairs from 1 through 8, and Channel Groups from 1 through 13. Use "*" for All Channels.	
Message Response:	<b>R</b>	
Examples:	Pause Channel Pair 2.	<b>P2PA</b>
	Pause Channel Group 1.	<b>G1PA</b>

## Stop - RJ

Description: This command causes the ProTraXX to stop playback of the specified Channel Pair or Channel Group.

Command Bytes: **<d>RJ**

Parameters: **<d>** is either **C** followed by a channel number in ASCII, **P** followed by a channel pair number in ASCII, or **G** followed by a channel group number in ASCII

Comments: Channel numbers range from 1 through 16, Channel Pairs from 1 through 8, and Channel Groups from 1 through 13. Use "\*" for All Channels.

Message Response: **R**

Examples:	Stop Channel Pair 2.	<b>P2RJ</b>
	Stop Channel Group 1.	<b>G1RJ</b>



## Aux Input to Channels

Description:	This command will route the audio being received on the ProTraxx's auxiliary inputs to the specified channel, channel pair, or channel group.	
Command Bytes:	<b>CL&lt;d&gt;PL</b>	
Parameters:	<d> is either <b>C</b> followed by a channel number in ASCII, <b>P</b> followed by a channel pair number in ASCII, or <b>G</b> followed by a channel group number in ASCII	
Comments:	Channel numbers range from 1 through 16, Channel Pairs from 1 through 8, and Channel Groups from 1 through 13. Use "*" for All Channels.	
Message Response:	<b>R</b>	
Examples:	Route Aux Input to Channel Pair 2.	<b>CLP2PL</b>
	Route Aux Input to Channel Group 4.	<b>CLG4PL</b>
	Route Aux Input to All Channels.	<b>CL*PL</b>

## Add Channels to Channel Group

Description:	This command will create a group from the specified channels. This allows you to control the grouped channels as one.	
Command Bytes:	<b>A&lt;n&gt;C&lt;#,#,#&gt;GR</b>	
Parameters:	<n> is the channel group number(1-16) <#,#,#> are the channels to be added to the group, separated by commas. (up to 16)	
Comments:	To clear the group, issue the command with no channels listed after <b>P</b>	
Message Response:	<b>R</b>	
Examples:	Add channel pairs 2,3,6 to Group 3.	<b>A3C2,3,6GR</b>
	Clear group 6.	<b>A6CGR</b>

# Playlists

## Play System Playlist

Description:	This command causes the ProTraXX to start a playlist as the system playlist (not tied to any particular channel).	
Command Bytes:	<n>PL or "<filename>"PL	
Parameters:	<n> is the ASCII playlist number between 0-99999 <filename> is the ASCII playlist file name	
Message Response:	<b>R</b>	
Comments:	Playlists named ply00000.lst will automatically be started as the system playlist on startup.	
Examples:	Start playlist 3 as the system playlist	<b>3PL</b>
	Start playlist "cmds.lst" as the system playlist	<b>"cmds.lst"PL</b>

## Play Channel Playlist

Description:	This command causes the ProTraXX to start a playlist on a specified channel pair	
Command Bytes:	<n><d>PO or "<filename>"<d>PO	
Parameters:	<n> is the ASCII playlist number between 0-99999 <filename> is the ASCII playlist file name <d> is <b>P</b> followed by a channel pair number in ASCII	
Minimum OS Version:	TraXXOS 1.2.3	
Message Response:	<b>R</b>	
Examples:	Start playlist 3 as the channel pair 2 playlist	<b>3P2PO</b>
	Start playlist "cmds.lst" as the channel pair 3 playlist	<b>"cmds.lst"P3PO</b>

## Stop Channel Playlist

Description:	This command stops a channel playlist	
Command Bytes:	<d>RJ	
Parameters:	<d> is <b>P</b> followed by a channel pair number in ASCII	
Message Response:	<b>R</b>	

## Paging Commands

### Set Paging Zone

Description:	This command sets the channel, channel pair, or channel group that the microphone is routed to when the paging trigger is activated or a start paging command is received.	
Command Bytes:	<b>Z&lt;d&gt;ZN</b>	
Parameters:	<d> is either <b>C</b> followed by a channel number in ASCII, <b>P</b> followed by a channel pair number in ASCII, or <b>G</b> followed by a channel group number in ASCII	
Comments:	Channel numbers range from 1 through 16, Channel Pairs from 1 through 8, and Channel Groups from 1 through 13. Use "*" for All Channels.	
Minimum OS Version:	TraXXOS 1.2.4	
Message Response:	<b>R</b>	
Examples:	Set the paging zone to Channel 3.	<b>ZC3ZN</b>
	Set the paging zone to Channel Group 2.	<b>ZG2ZN</b>

### Set Paging Trigger

Description:	This command specifies which input, front panel button, or push-to-talk will trigger the microphone to be routed to the set paging zone. Microphone paging will end when the paging trigger is released.	
Command Bytes:	<b>T&lt;t&gt;&lt;#&gt;ZN</b>	
Parameters:	<t> is one of the following (in ASCII): <b>I</b> - Input <b>B</b> - Front Panel Button <b>K</b> - Mic Push-To-Talk Switch (Pins 4,5 of Microphone Connector) <#> is the number of the Input or Button	
Comments:	If specifying the microphone PTT as the trigger, no <#> field is needed. Button and Input numbers range from 1 to 16.	
Minimum OS Version:	TraXXOS 1.2.4	
Message Response:	<b>R</b>	

Examples:	Set the microphone PTT button to be the paging trigger.	<b>TKZN</b>
	Set rear input #3 to be the paging trigger.	<b>TI3ZN</b>
	Set front panel button #12 to be the paging trigger.	<b>TB12ZN</b>

## Start Paging

**Description:** This command routes the microphone input to the specified paging zone. Paging will continue until a “Stop Paging” command is received. If using the paging trigger to initiate microphone paging, this command is not required.

**Command Bytes:** **BZN**

**Minimum OS Version:** TraXXOS 1.2.4

**Message Response:** **R**

**Examples:** Begin paging to the selected paging zone. **BZN**

## Stop Paging

**Description:** This command stops paging to the paging zone and returns all channels in the current paging zone to their previous state. If using the paging trigger to initiate microphone paging, this command is not required.

**Command Bytes:** **EZN**

**Minimum OS Version:** TraXXOS 1.2.4

**Message Response:** **R**

**Examples:** Stop paging to the selected paging zone. **EZN**

# Control Commands

These commands control some of the operational modes of the ProTraXX. Other operational modes and unit configuration can be accomplished by using the LCD menu system on the front panel.

## Keylock Enable

Description:	This command is used to disable the front panel buttons of the ProTraXX.	
Command Bytes:	<b>B&lt;n&gt;KL</b>	
Parameters:	<n> is 0 to disable buttons, 1 to enable buttons.	
Message Response:	<b>R</b>	
Examples:	Lock front panel buttons.	<b>B1KL</b>

## LCD PIN Enable

Description:	This command is used to enable or disable the LCD PIN number lock. When enabled, a 4-Digit PIN number is required to access the front panel menu.	
Command Bytes:	<b>L&lt;n&gt;KL</b>	
Parameters:	<n> is 0 to disable PIN, 1 to enable PIN.	
Message Response:	<b>R</b>	
Examples:	Enable LCD PIN lock.	<b>L1KL</b>

## LCD PIN Set

Description:	This command is used to set the 4-digit PIN number that is required to unlock the front panel LCD menu, when enabled.	
Command Bytes:	<b>S&lt;n&gt;KL</b>	
Parameters:	<n> is a 4 digit PIN.	
Message Response:	<b>R</b>	
Examples:	Set PIN to 1234.	<b>S1234KL</b>

## Version Request

Description:	This command is used request the operating system version.	
Command Bytes:	<b>?V</b>	
Message Response:	<b>ProTraXX x.x.x</b> Where x.x.x is the current version of the installed firmware.	
Example:	Get current version.	<b>?V</b>

**Note:** The firmware version can also be obtained from the LCD menu.

## Soft Reset

Description:	This command issues a software reset to the unit.	
Command Bytes:	<b>XX</b>	
Message Response:	<b>R</b>	
Example:	Reset Unit.	<b>XX</b>

## Set Name

Description:	This command gets/sets the user-readable name of the unit.	
Command Bytes:	<b>&lt;n&gt;NM</b>	
Parameters:	<b>&lt;n&gt;</b> is the desired ASCII name of the unit	
Message Response:	<b>R</b>	
Minimum OS Version:	TraXXOS 1.2.5	
Comments:	To get the current name of the unit, send <b>NM</b> without the <b>&lt;n&gt;</b> parameter.	
Examples:	Set unit name to “myTraXX”.	<b>myTraXXNM</b>
	Get the current unit name.	<b>NM</b>

## Mute/UnMute/Volume Control

Description:	This command causes the ProTraXX to mute, unmute, or set the volume level of the specified Channel, Channel Pair, or Channel Group.	
Command Bytes:	<v><d>AD	
Parameters:	<v> is one of the following (in ASCII): <b>M</b> - Mute <b>U</b> - Unmute <b>T</b> - Toggle Mute <b>#</b> - number between 0(silent) and 10(loudest) <d> is either <b>C</b> followed by a channel number in ASCII, <b>P</b> followed by a channel pair number in ASCII, or <b>G</b> followed by a channel group number in ASCII	
Comments:	Channel numbers range from 1 through 16, Channel Pairs from 1 through 8, and Channel Groups from 1 through 13. Use "*" for All Channels.	
Message Response:	<b>R</b>	
Examples:	Mute Channel 2.	<b>MC2AD</b>
	Unmute Channel Group 1.	<b>UG1AD</b>
	Set Volume of Channel 3 to 7/10	<b>7P3AD</b>

## Mic In/Aux In Volume Control

Description:	This command sets the input volume level of the ProTraXX's microphone input and auxiliary inputs.	
Command Bytes:	<b>I&lt;s&gt;&lt;g&gt;AD</b>	
Parameters:	<s> is either <b>L</b> for the aux inputs or <b>M</b> for the microphone input <g> is the desired level in dB	
Minimum OS Version:	TraXXOS 1.2.3	
Comments:	Levels can range from -64 to 24. By default, the input level is set to 0dB. Increasing the level past 0dB can cause distortion. Input volume settings will stay active while the unit is powered, and reset to default(0dB) on boot. You can put the command in your playlist #0 file to automatically set input level on startup.	
Message Response:	<b>R</b>	
Examples:	Set Mic Input to -10dB.	<b>IM-10AD</b>
	Set Aux Input to +3dB.	<b>IL3AD</b>

## Send String

Description: This command sends an ASCII string from ProTraXX to the specified destination.

Command Bytes: "<s>"<d><o>SS

Parameters: <s> is the string to be sent  
<d> is the destination, one of:  
    **S – Serial**  
    **U – UDP(over Ethernet)**  
    **B – USB Serial**  
<o> is only required for UDP, and is the destination info in the form of:  
    <XXX.XXX.XXX.XXX>:<PPPPP>:<SSSSS> where,  
        <XXX.XXX.XXX.XXX> is destination IP  
        <PPPPP> is destination port  
        <SSSSS> is source port

Comments: The <o> field is not necessary if using Serial or USB Serial destination.  
You must escape all special characters in the string to be sent(such as quotation marks). For example, "State=\"Playing\"\\r" would send: State="Playing"\\r

Message Response: **R**

Examples: Send 'Done' out the serial port:  
    **"Done"SSS**  
Send 'Done Playing' to 192.168.0.254 port 2639 from port 2638:  
    **"Done Playing"U192.168.0.254:2639:2638SS**  
Send 'State="Playing"\\r' to 192.168.0.254 port 2639 from port 2638:  
    **"State=\"Playing\"\\r"U192.168.0.254:2639:2638SS**



## Status Request

Examples:	Get Channel 3 Status	<b>C3?P</b>
	<i>Example Response: S</i>	
	Get Channel Group 2 Status	<b>G2?P</b>
	<i>Example Response: 2 P&lt;h0d&gt;3 P&lt;h0d&gt;4 P&lt;h0d&gt;</i>	

## Filename Status Request

Minimum OS Version:	TraxXOS 1.3.0
Message Response:	<f> or <c> <f> <c> is the channel number <f> is the filename
Examples:	Get Channel Pair 3 Status                  P3?C Example Response: 5 m <sup>usic</sup> 1.m <sup>p3</sup> <h0d>6 m <sup>usic</sup> 2.m <sup>p3</sup> <h0d> Get Channel Group 2 Status                G2?C Example Response: 2 y <sup>ell</sup> .m <sup>p3</sup> <h0d>3 s <sup>ing</sup> .m <sup>p3</sup> <h0d>4 h <sup>i</sup> .m <sup>p3</sup> <h0d>

## Completion Acknowledge Mode

**Description:** This command is used to select the Completion Acknowledge mode. When the ProTraXX finishes playing a file, it can send a Completion Acknowledge response or trigger a command.

There are 2 different completion acknowledge modes possible. This *Completion Acknowledge Mode* remains as long as the ProTraXX is powered. **Note:** The unit defaults to no completion acknowledge whenever the unit first powers up.

**Message Response:** **R**

**Command Bytes:** **<s>"<c>"<d>AK** Selects advanced channel response mode. This allows you to specify a command to be executed when the status of a channel pair or group changes.

**<s>** is the channel status to trigger on

- P** for play started
- S** for stopped
- L** for looped
- A** for paused

**<c>** is the command to perform when this status occurs (such as \\"CH1 Stopped\\"SS)

**<d>** is either **C** followed by a channel number in ASCII, **P** followed by a channel pair number in ASCII, or **G** followed by a channel group number in ASCII

**RAK** Selects simple channel response mode.

**CH** is sent out the serial port upon a channel pair stopping, where CH = ASCII representation of the Channel pair number (0 through 7). For a completion ack via Ethernet, use the above advanced mode with a Send String command.

**Examples:** Select simple command response mode:

**RAK**

Use advanced channel response mode to send "ChPair1Started" over UDP to 192.168.1.100 port 2639 from port 2640 whenever channel pair 1 starts:

**P\\"ChPair1Started\\"U192.168.5.150:2639:2640SS"P1AK**

# How To Update Firmware

Under certain circumstances, it may be necessary to update the operational firmware. Do not update the firmware unless there is a specific need to do so.

## Standard Firmware Update

1. Download the latest firmware for the ProTraXX product from <http://www.alcorn.com/support/firmware.html>
2. Copy the new firmware file to your Compact Flash card. The file must be named “OS.NEW” if updating only one unit or “FACTORY.NEW” if updating multiple units using the same CF card. You may copy it directly using a CF card reader or over a network via FTP.
3. Reset this product by either power-cycling or sending the reset command. It is also possible to begin the update process from the LCD System menu.
4. When the CF card is detected after loading, the new firmware file will be located and the update process will begin. **Do not remove power from the unit during the update.**
5. When the LCD display reads “Update Complete” and the file access LED is off, the firmware update is complete. If your firmware file was named “OS.NEW” it will be renamed to “OS.SAV” and the unit will automatically restart.
6. If the firmware update fails (i.e. power was interrupted during update), please follow the directions under “Firmware Recovery”.

## Firmware Recovery

1. Remove power from the unit.
2. Set DIP Switch 3 to the ON position.
3. Download the latest firmware for this product from <http://www.alcorn.com/support/firmware.html>
4. Copy the new firmware file to your Compact Flash card. The file must be named “OS.NEW” if updating only one unit or “FACTORY.NEW” if updating multiple units using the same CF card. You must copy the file directly to the CF card using a CF card reader.
5. Insert the CF card, with the firmware update file, into the unit.
6. Apply power to the unit.
7. The new firmware file will be located and the update process will begin.
8. When the LCD display reads “Update Complete” and the file access LED is off, the firmware update is complete.
9. Remove power from the unit.
10. Set DIP Switch 3 to the OFF position.
11. Apply power to the unit.

# Troubleshooting Guide

**Q:** Using the discrete inputs, the front panel LEDs do not turn on and the unit does not play.

**A:** Verify that the Voltage/Contact Closure setting is properly configured.

**Q:** I've copied several files from my PC onto a Compact Flash, but they do not play.

**A:** The Compact Flash may have been pre-formatted in a way that is incompatible with the ProTraXX operating system. Be sure you have saved your files, then format the card as Microsoft FAT32.

**Q:** Audio playback is too fast or too slow.

**A:** All files played on the ProTraXX must be encoded to use the same sample rate (i.e all 44.1KHz or all 48KHz, etc.). You cannot mix and match sample rates.

**Q:** I hear snaps and pops in the playback audio, especially when playing all of the channels.

**A:** Make sure that your maximum encoded bitrate is no greater than 192kbps if playing 8 stereo files and 128kbps if playing more than 8 simultaneous files. If playing more than 8 files at once, please verify that they are mono files. ProTraXX supports a maximum of 8 stereo mp3s, or 16 mono.

For the answers to other questions, check out the Alcorn McBride Knowledge Base at <http://www.alcorn.com/kb>

If you don't find it there, please email our technical support staff at [support@alcorn.com](mailto:support@alcorn.com)

# Specifications

<b>Audio</b>	Tracks: 16 Mono or 8 Stereo Format: MPEG-1 Part 3 (or simply, MP3) defined in ISO/IEC-11172-3 Maximum Bitrate: 192kbps for 8 simultaneous stereo, 128kbps for 16 simultaneous mono Sample Rate: 44.1Khz or 48Khz DAC Resolution: 16 Bits Frequency Response: 10 to 20 Khz +/-0.1 dB (dependent on MP3 encoding) Line Output Level: Balanced, +4dBu
<b>Playback Time:</b>	Approximately 1 MByte per minute per channel with excellent audio quality at 128kbps
<b>Controls:</b>	Discrete: 16 programmable and individually configurable contact or voltage (12-24vdc) inputs Serial: DB9M RS-232 9600,N,8,1 Ethernet (10/100Base-T, UDP control, FTP file transfer, NTP time protocol) USB Serial
<b>Connectors:</b>	DB-9M serial RS-232 connector USB type-B connector for USB serial RJ45 jack for Ethernet connection Phoenix Type screw terminals for discrete controls Phoenix Type screw terminals for balanced audio output Barrel connector for power GPS: 6-Pin mini-DIN 5-Pin XLR for Microphone with key RCA type connectors for stereo line input
<b>Front Panel:</b>	16 Direct-play pushbuttons Rotary encoder with LCD menus 16 channel status LEDs, Power LED, Comm & Status LEDs. Compact Flash Socket
<b>Power:</b>	9 VDC to 36 VDC at 2 Amp max on threaded barrel connector Class 2 Power Adapter for 115 or 230 volts included
<b>Physical:</b>	Size: 19" W x 1.75" H x 10.88" D (48.3 cm W x 4.5 cm H x 27.64 cm D) Weight: 8.5lbs. (3.9kg) Environment: 0°C (32°F) to 38°C (100°F) 0-90% Relative Humidity
<b>Compliance:</b>	CE, UL, CSA, WEEE, RoHS

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